



Biology of Lake Sturgeon

Lake Sturgeon *Acipenser fulvescens*, inhabit large river and lake systems primarily in the Mississippi River, Hudson Bay and Great Lakes basins. It has and continues to represent an important biological component of the Great Lakes fish community. By the early 1900's many populations of lake sturgeon throughout their range had been greatly reduced or extirpated as a result of overfishing, habitat loss, the construction of dams, and pollution. Lake sturgeon are listed as either threatened or endangered by 19 of the 20 states within its original range in the United States. This ancient family of fishes has been recognized since the Upper Cretaceous period (136 million years ago), at a time when dinosaurs were at the height of their development.



Lake sturgeon are the only sturgeon species endemic to the Great Lakes basin and are the largest freshwater fish indigenous to that system. Lake sturgeon can be considered a nearshore, warmwater species with water temperature and depth preferences of low 50s to mid-60°F and 15-30 feet, respectively. Lake sturgeon are benthivores, feeding on small invertebrates such as insect larvae, crayfish, snails, clams, and leeches.

Life history characteristics of lake sturgeon are unique with respect to other fishes and are as follows:

- sexual maturity in females is reached between 14 and 33 years, most often from 24-26 years; and, 8 to 12 years for males (but may take up to 22 years);
- female lake sturgeon spawn once every 4 to 9 years while males spawn every 2 to 7 years;
- spawning occurs on clean, gravel shoals and stream rapids from April to June in preferred water temperatures of 55-64°F;
- female lake sturgeon lay 4,000 to 7,000 eggs per pound of fish;
- growth rates are quite variable throughout its range and depend on temperature, food availability, and water quality; and,
- the typical life-span of lake sturgeon is 55 years for males and 80-150 years for females.

As a consequence of interrupted spawning cycles, only 10-20% of adult lake sturgeon within a population are sexually active and spawn during a given season.

Little is known about seasonal movements of lake sturgeon. Some adult lake sturgeon have been found to remain in a small territory during the summer months. While others have been observed long distances from their original capture site one year later. Adult sturgeon habitually return to spawn in streams



where they were born (homing behavior), often migrating long distances up rivers in the spring. After hatching, some young lake sturgeon have been observed to remain in their natal rivers for their first summer of life.

History of the Great Lakes Population

The most accurate, yet biased, representation of the history of Great Lakes lake sturgeon populations is through the use of commercial harvest data. A summary of the catch, by era, is discussed below.

Pre-1900

Early commercial fisherman (pre-1850) perceived lake sturgeon as a nuisance fish because of fishing gear destruction. This led to their wide-spread slaughter. As the economic importance of this species was later recognized, a targeted commercial fishery intensified by the mid- to late-1800s. For example, during the heavy fishing years from 1879 to 1900, the commercial catch of lake sturgeon in the Great Lakes averaged over 1,814 metric tons (4 million pounds). In 1885, a maximum of 4,901 metric tons (8.6 million pounds) were harvested, of which 2,359 tons (5.2 million pounds) came from Lake Erie.

1900 to 1986

From 1900 to the 1970s, little is known about the lake sturgeon populations, except for their continued decline. For example, by the late 1900's, 80% of the lake sturgeon were removed from Lake Erie. Commercial harvest was reported until 1977, but at very low numbers after 1956. In the late 1970's, Canadian commercial operations in Lake Erie reported harvests of 1.36 to 2.27 metric tons (3 to 5 thousand pounds); much reduced from the previous century. In Lake Michigan, commercial harvest was closed in 1929 after the catch declined to only 2000 pounds compared to 3.8 million pounds harvested in 1879.

Factors affecting the decline in lake sturgeon populations include commercial overexploitation, followed by some degree of habitat loss and degradation. Also, the reproductive cycle further complicates recruitment; hence, catalyzing their dramatic decline.

Habitat loss is sure to be a contributing factor to the demise of lake sturgeon. For example, in all the Great Lakes, damming of tributaries prevented access to historical spawning grounds, destruction of spawning areas occurred via siltation from deforestation, agriculture, and dredging, and pollution from nutrient and contaminant loads further hindered reproductive success.

1987 to Present

Consequent to the decline, only a remnant population remains today in most Great Lakes areas. As a result of these declines, lake sturgeon are: (U.S.) recognized by the American Fisheries Society as threatened in North America and, listed as



Endangered, Threatened, or Special Concern in 19 of 20 states throughout its range. Lake sturgeon are protected in Canadian waters of the Great Lakes with closed seasons, size limits, creel limits, and gear restrictions.

Recently, interest in the restoration of lake sturgeon has increased greatly. The fish can serve as an indicator of ecosystem health and biodiversity, particularly because of its unique life history characteristics. Also, with the addition of zebra and quagga mussels, *Dreissena* sp., the energy flow is apparently shifting to the benthos. This could support increases in populations of benthic feeding fish such as the native lake sturgeon.



Partnerships have been developed throughout the Great Lakes basin between natural resource agencies and commercial fishers, anglers, recreationalists, landowners, and other water users to report lake sturgeon sightings to their respective management agency. Some partnerships allow temporary possession so critical information can be collected from the specimens.

Lake sturgeon throughout the Great Lakes appear to be on the rebound. The recent sightings and scientific research indicate age-class structure within the current populations. This is a positive sign that natural reproduction is occurring, particularly with the number of juvenile sightings. Although populations are believed to be increasing, they are still impaired with relation to historical abundance.

Contaminant burdens on lake sturgeon are not well known; however, researchers have documented low hatching success and high larval deformities in polluted streams in Montreal. Lake sturgeon in some waters do not seem to accumulate high contaminate loads while other populations do. Contaminant loading depends on the quality of the environment in which the fish live.

